CLAIMS

1.   A system for managing address allocation of a
mobile terminal in WLAN inter-working without depending on
local WLAN access control, wherein a secure end-to-end
5   service authorization signalling between the mobile
terminal and a controller in a home domain of the mobile
terminal that has access to user subscription information
is used for address management, whereby the controller can
manage the address allocation based on service
10   authorization information.

2.   A system for managing a tunnel used by a
mobile terminal in WLAN inter-working without depending on
local WLAN access control, wherein a secure end-to-end
15   service authorization signalling between the mobile
terminal and a controller in a home domain of the mobile
terminal that has access to user subscription information
is used for tunnel management, whereby the controller can
manage the tunnel based on service authorization
20   information.

3.   A system for managing address allocation of a
mobile terminal and a tunnel used by a mobile terminal in
WLAN inter-working without depending on local WLAN access
25   control, wherein a secure end-to-end service authorization

signalling between the mobile terminal and a controller in
a home domain of the mobile terminal that has access to
user subscription information is used for address and
tunnel management, whereby the controller can manage the
5   address allocation and the tunnel based on service
authorization information.

      4.   The system according to any one of claims 1 to
3, wherein security association derived from a local WLAN
10   access control procedure for encrypting and protecting a
signalling message is used for protecting a signalling
message for the WLAN inter-working.

      5.   The system according to any one of claims 1 to
15   3, wherein domain information of the mobile terminal is
used for deciding the location of the controller in the
home domain of the mobile terminal.

      6.   The system according to any one of claims 1 to
20   3, wherein the mobile terminal embeds its domain
information in a message, and an intermediary node between
the mobile terminal and the controller accesses the domain
information and forwards the message based on the domain
information, whereby the intermediary node decides an
25   address for forwarding the message to the controller.

7.   The system according to claim 1 or 3 wherein

i.   a predefined wildcard value is used in an address allocation request and an address allocation

5   reply for supporting stateless address configuration at the mobile terminal,

ii.   an address type list is included in the address allocation request and the address allocation reply for supporting different address types at the mobile

10   terminal, and

iii.   an address prefix is included in an address management message for supporting multiple address allocation for the mobile terminal.

15   8.   The system according to claim 1 or 3 wherein

i.   the mobile terminal generates an identifier that uniquely identifies a service access session,

ii.   the service access session identifier is included in an address message sent between the mobile

20   terminal and the controller for binding address allocation operation with the service access session,

iii.   the controller traces an address which the mobile terminal uses for the service access session, and

iv.   the controller retrieves the address used by

25   the mobile terminal for the service access session by

using the service access session identifier.

9.   The system according to claim 8 wherein the controller uses a backend server for storage and

5   maintenance of the mobile terminal's address which is used for the service access session.

10.   The system according to claim 8 wherein

i.   the controller creates a new entry with the

10   mobile terminal's identifier and the service access session's identifier as an index when the entry does not exist in a controller's record,

ii.   the controller stores the entry with the address which is allocated for the mobile terminal for the

15   service access session, and

iii.   the controller deletes the entry when the mobile terminal terminates the services access session,

whereby the controller can maintain the address configuration of the mobile terminal in the WLAN inter-

20   working.

11.   The system according to claim 1 or 3 wherein

i.   an address allocation request and a corresponding service access request are grouped in the

25   service authorization information for supporting multiple

address allocation for different services access sessions

of the mobile terminal, and

ii.   the controller obtains different address

configurations based on the different service access

5   requests of the mobile terminal,

whereby simultaneous service sessions are allowed

for the mobile terminal.

12.   The system for supporting multiple address

10 configurations for multiple services sessions according to

claim 11, wherein

i.   the mobile terminal maintains a local database

of the service access session information with the

corresponding address configuration, and

15   ii.   the mobile terminal uses different addresses

to access different services by multiplexing addresses

using the service access session identifiers.

13.   The system for allowing adjustment of policy

20 settings according to any one of claims 1 to 3, wherein

i.   the controller modifies policy configuration

for providing service to the mobile terminal by setting an

interface with a policy server, and

ii.   policy setting is adapted on a control node

25 for providing service to the mobile terminal in WLAN by

having the controller triggering policy signalling to the control node through policy control framework.

14. The system according to claim 13 wherein a set of message format used for information exchange between a service authorizer which authorizes service and a policy server, the set of message format comprising:

i. a operation identifier part that indicates operation to be taken by the policy server;

ii. a mobile terminal identifier part that includes an identifier of the mobile terminal;

iii. a mobile terminal location information part that includes location information of the mobile terminal for adapting policy settings based on the location information;

iv. a mobile terminal service information part that includes service type of the service, and session identifier of the service if necessary;

v. a tunnel setting information part that includes tunnel setting information used by the mobile terminal for accessing the service; and

vi. an address information part that includes address information of the mobile terminal for accessing the service.

15. A method for managing address allocation of a mobile terminal for accessing service in WLAN inter-working without depending on local WLAN access control comprising:

5   i.   a step in which the mobile terminal sends an address management request together with a secure end-to-end service authorization request to a controller in a home domain of the mobile terminal that has access to user subscription information;

10   ii.   a step in which the controller allocates an address for the mobile terminal to access service based on the service authorization request and the user subscription information; and

           iii. a step in which the controller sends address
15 management information to the mobile terminal with the secure end-to-end service authorization signalling.

16. A method for managing address allocation of a mobile terminal for accessing service in WLAN inter-
20 working without depending on local WLAN access control comprising:

           i.   a step in which the mobile terminal sends an tunnel management request together with a secure end-to-end service authorization request to a controller in a
25 home domain of the mobile terminal that has access to user

subscription information;

 ii. a step in which the controller decides tunnel configuration for the mobile terminal to access service based on the service authorization request and the user

5 subscription information; and

 iii. a step in which the controller sends tunnel configuration information to the mobile terminal with the secure end-to-end service authorization signalling.

10 17. A method for managing address allocation of a mobile terminal for accessing service in WLAN inter-working without depending on local WLAN access control comprising:

 i. a step in which the mobile terminal sends an

15 address and tunnel management request together with a secure end-to-end service authorization request to a controller in a home domain of the mobile terminal that has access to user subscription information;

 ii. a step in which the controller decides an

20 address and tunnel configuration for the mobile terminal to access service based on the service authorization request and the user subscription information; and

 iii. a step in which the controller sends information on the address and the tunnel configuration to

25 the mobile terminal with the secure end-to-end service

authorization signalling.

18.   The method according to any one of claims 15 to 17, wherein security association derived from a local WLAN access control procedure for encrypting and protecting a signalling message is used for protecting a signalling message for the WLAN inter-working.

19.   The method according to any one of claims 15 to 17, wherein domain information of the mobile terminal is used for deciding the location of the controller in the home domain of the mobile terminal.

20.   The method according to any one of claims 15 to 17, wherein the mobile terminal embeds its domain information in a message, and an intermediary node between the mobile terminal and the controller accesses the domain information and forwards the message based on the domain information, whereby the intermediary node decides an address for forwarding the message to the controller.

21.   The method according to claim 15 further comprising a step in which the address to be used by the mobile terminal for accessing the service is negotiated between the controller and an address management entity in

a network that provides the service requested by the
mobile terminal.

22.   The method for reducing service interruption

5   of the mobile terminal according to claim 15, further

comprising:

i.   a step in which the mobile terminal includes a
specific address in an address allocation request sent to
the controller in its home network; and

10   ii.   a step in which the controller allocates the
address to be used according to the address allocation
request from the mobile terminal and information about the
service accessed by the mobile terminal.

15   23.   The method for supporting multiple tunnel
types and directions according to claim 16 or 17, further
comprising:

i.   a step in which the mobile terminal includes a
list of tunnel types in a tunnel request message sent to

20   the controller; and

ii.   a step in which the mobile terminal and the
controller include tunnel direction information in the
tunnel request message and tunnel configuration message.

25   24.   The method for managing the tunnel

configuration of the mobile terminal according to claim 16

or 17, comprising a step in which a tunnel configuration

to be used by the mobile terminal for accessing the

service between the controller and an actual tunnel end

5   point in a network that provides the service requested by

the mobile terminal.

25.   The method for managing the tunnel

configuration of the mobile terminal according to claim 16

10   or 17, further comprising:

i.   a step in which the controller communicates

with a management entity in the WLAN managing tunnels used

by the mobile terminal for accessing the service; and

ii.   a step in which the management entity in the

15   WLAN enables or disables the tunnel according to a

communication result with the controller.

26.   The method for setting up a network based site

to site tunnel for the mobile terminal to access the

20   service according to claim 16 or 17, further comprising:

i.   a step in which the controller communicates

with a tunnel management entity in the WLAN to identify

and configure a tunnel end point in the WLAN; and

ii.   a step in which the controller communicates

25   with a tunnel management entity in a network providing the

service for the mobile terminal to identify and configure the tunnel end points in the network.

27. The method according to claim 16 or 17 comprising a step in which the controller communicates with a backend server in the mobile terminal's home network for the user's subscription information.

28. The method according to claim 15 or 17, wherein the mobile terminal uses a set of message format, the set of message format comprising:

i. a home domain information part that includes the mobile terminal's home domain information accessible to all network nodes;

ii. a user's identity information part that is only accessible by a node authorizing a service request;

iii. a service request information part that contains one or more service requests only accessible by the node authorizing the service request;

iv. a WLAN identifier information part; and

v. a address request information part that contains one or more address requests corresponding to the service request.

29. The method according to claim 16 or 17,

wherein the mobile terminal uses a set of message format, the set of message format comprising:

    i.   a mobile terminal's home domain information part;

5   ii.   a user's identity information part that is only accessible by the node authorizing a service request;

    iii.   a service request information part that contains one or more service requests only accessible by the node authorizing the service request;

10   iv.   a WLAN identifier information part that includes a WLAN identifier; and

    v.   a tunnel configuration request information part that includes one or more tunnel configuration requests corresponding to the service request.

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    30.   The method according to claim 21, wherein the controller uses a set of message format, the set of message format comprising:

    i.   a part of an identifier of the mobile

20   terminal's home network;

    ii.   a part of an identifier of the service session regarding a service request;

    iii.   a part of an identifier of the mobile terminal in the service request;

25   iv.   a service request information part that

includes one or more service requests; and

     v.   a address configuration request information part that includes one or more address configuration requests corresponding to the service request.

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     31.   The method according to claim 24, wherein the controller uses a set of message format, the set of message format comprising:

     i.   a part of an identifier of the mobile

10   terminal's home network;

     ii.   a part of an identifier of the service session regarding a service request;

     iii.   a part of an identifier of the mobile terminal in the service request;

15   iv.   a service request information part that includes one or more service requests; and

     v.   a tunnel configuration request information part that includes one or more tunnel configuration requests corresponding to the service request.